

REMARKS/ARGUMENTS

Applicants would like to thank Examiner Cheu and Supervisor Le for the telephone interview that took place on October 5, 2004. In the interview, changes to claim 1 were discussed, including the incorporation of language to “a sample chamber comprising a sample cavity”, the clarification that the sample is not in contact with the phase control section, and the incorporation of language relating to microfluidic channels. Applicants pointed out that the Beregovsky et al. reference does not teach a phase control section separate from a sample cavity and is therefore not a proper secondary reference. Examiner Cheu and Supervisor Le agreed to reconsider the claims in light of amendments incorporating the discussed changes.

Claims 1-24 are pending.

Claim 4 is canceled. Claims 3 and 5 are amended to refer to “sample chamber” as in the original claims. Claim 1 is amended to incorporate language relating to microchannels. Support is found in the specification and original claim 4. Claims 1 and 10 are amended to clarify that a sample in the sample chamber is not in contact with the phase control section. Support is found in Figures 4 and 6.

Rejections under 35 USC § 112

Regarding the rejections under 35 USC § 112, first paragraph, claim 1 is amended to clarify that the chip device includes a sample chamber comprising a sensor cavity. Support is found at paragraph [0026], lines 5-6. Claim 10 is amended to refer to a sample “chamber”, as in the original claim.

Regarding the rejections under 35 USC § 112, second paragraph, claim 1 is amended to clarify that the sensor cavity is physically separate from the phase control section. This is shown in Figures 13 and 14, for example, where the sensor cavity 48 is separated from the phase control section 56 by a space. Claims 10 and 22 are amended in a similar fashion.

Claim 1 is also amended to clarify that the sample chamber has an inlet and an outlet for receiving and discharging fluid, respectively. Claim 17, which ultimately depends from claim 1, is similarly amended. In claim 10, the term “sample region” is replaced by “sample chamber” as in the original claim. Claims 20 and 21 are similarly amended to refer to a “sample chamber”.

Rejections under 35 USC § 103

The rejection of claims 1, 2, 5-16, 20 and 21 as obvious over Lading et al. in view of the paper by Beregovski et al. is respectfully traversed. Lading et al. teach a detection device comprising a reference and a sensor laser, each laser having a gain region, mirrors and a laser cavity. A detecting substance is immobilized on the upper surface of the sensor laser. However, Lading et al. do not teach or describe any phase control section of the laser. Beregovski et al. teach an optical sensor comprising a sensing laser which has a gain section, mirror section and phase control section. However, Beregovski et al. only teach a phase control section that is covered by a layer sensitive to a chemical to be detected.

“To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.” *In re Royka*, 490 F. 2d 981, 180 USPQ 580 (CCPA 1974); MPEP § 2143.03. In the present case, the prior art does not meet this standard.

As amended, claims 1, 2, 5-16, 20 and 21 call for a sample chamber comprising a sensor cavity that is physically separate from a phase control region. As the Office Action recognizes, Lading et al. do not describe or even mention any phase control region. As for the Beregovski et al. reference, this reference does not teach a phase control section physically separate from a sensor region. Rather, Beregovski et al. only teach a phase control section covered with a chemical sensing layer. Because neither reference teaches or suggests a phase control section physically separate from a sensor region, all claim limitations are not taught or suggested. Accordingly, claims 1, 2, 5-16, 20 and 21 are not obvious.

Moreover, claims 1, 2, 5-16, 20 and 21 have been amended to clarify that a sample in the sample chamber is not in contact with the phase control section. Again, neither reference teaches such an arrangement. Lading et al. do not teach or suggest a phase control section, and in the Beregovski et al. reference, a sample must contact the phase control section to interact with the chemical sensing layer. Because all claim limitations are not taught, claims 1, 2, 5-16, 20 and 21 are not obvious.

Further, to establish a *prima facie* case of obviousness, “there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.” MPEP § 2143. The prior art must suggest the desirability of combining the references. MPEP § 2143.01. Again, the prior art in the present case fails to achieve this standard.

Claims 1, 2, 5-16, 20 and 21 call for a sample chamber comprising a sensor cavity that is physically separate from a phase control region. According to the Office Action, it would be obvious to combine the detection device of Lading et al. with the phase control section of Beregovski et al. However, there is no motivation or suggestion to combine the references in this manner.

Lading et al. do not disclose any phase control region. Beregovski et al. only teach a phase control section covered with a chemical sensing material. The whole basis for chemical sensing in the detection scheme of Beregovski et al. is the use of phase sections “covered with a layer sensitive to the chemical in question” (page 117, col. 1, section 2.1; Fig 1). A phase control section without a sensing layer would defeat the whole purpose of Beregovski et al. Because Beregovski et al. are concerned only with a phase control section covered with a chemical sensing layer, there is no suggestion or motivation to use a phase control section lacking a chemical sensing layer. Nothing suggests the desirability of combining the references in the way contemplated in the Office Action. Accordingly, claims 1, 2, 5-16, 20 and 21 are not obvious.

The rejection of claim 3 as obvious over Lading et al. and Beregovski et al., and further in view of Seul et al. is respectfully traversed. Claim 3 depends from claim 2 and is not obvious for the above-discussed reasons relating to claim 2. Further, Seul et al. have nothing to do with an integrated optical chip device using heterodying lasers.

The rejection of claims 17-19 and 22-24 as obvious over Lading et al. and Beregovski et al., and further in view of Bach et al. is respectfully traversed. For the reasons discussed above relating to obviousness, all claim limitations are not taught, and there is no suggestion or motivation to combine the Lading et al. and Beregovski et al. references. Moreover, Bach et al. are not concerned with lasers. Accordingly, claims 17-19 and 22-24 are not obvious.

In view of the foregoing amendments and remarks, Applicants submit that the present application is in condition for allowance. A Notice of Allowance is therefore respectfully requested.

November 2, 2004

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Miles Yamanaka", followed by a horizontal line.

Miles Yamanaka
Reg. No. 45, 665